



➤ Porganic, a research organic pig farm: overall presentation and two examples of research programs

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➤ Porganic: the research unit

Location: Rouillé in
the mid west of
France, 30 km south
west of Poitiers



➤ Porganic: the research unit

Main characteristics:

- ✓ Organic pig farm
- ✓ Farrow to finish farm
- ✓ 2 x 12 places in the farrowing building
- ✓ A single dynamic group for weaned/pregnant sows (36 places)
- ✓ 480 places in the weaning/fattening building
- ✓ 4 batches of ~12 sows farrowing at 6-week intervals
- ✓ Dam line: pure LW, Sire line: LW or Piétrain or Duroc (experimental needs)
- ✓ Weaning at 7 weeks of age
- ✓ ~ 10.6 piglets weaned/sow (details presented by *Canario*)
- ✓ Slaughter at ~125 kg liveweight & ~6 mo of age (details in *Ferchaud et al 2022*)

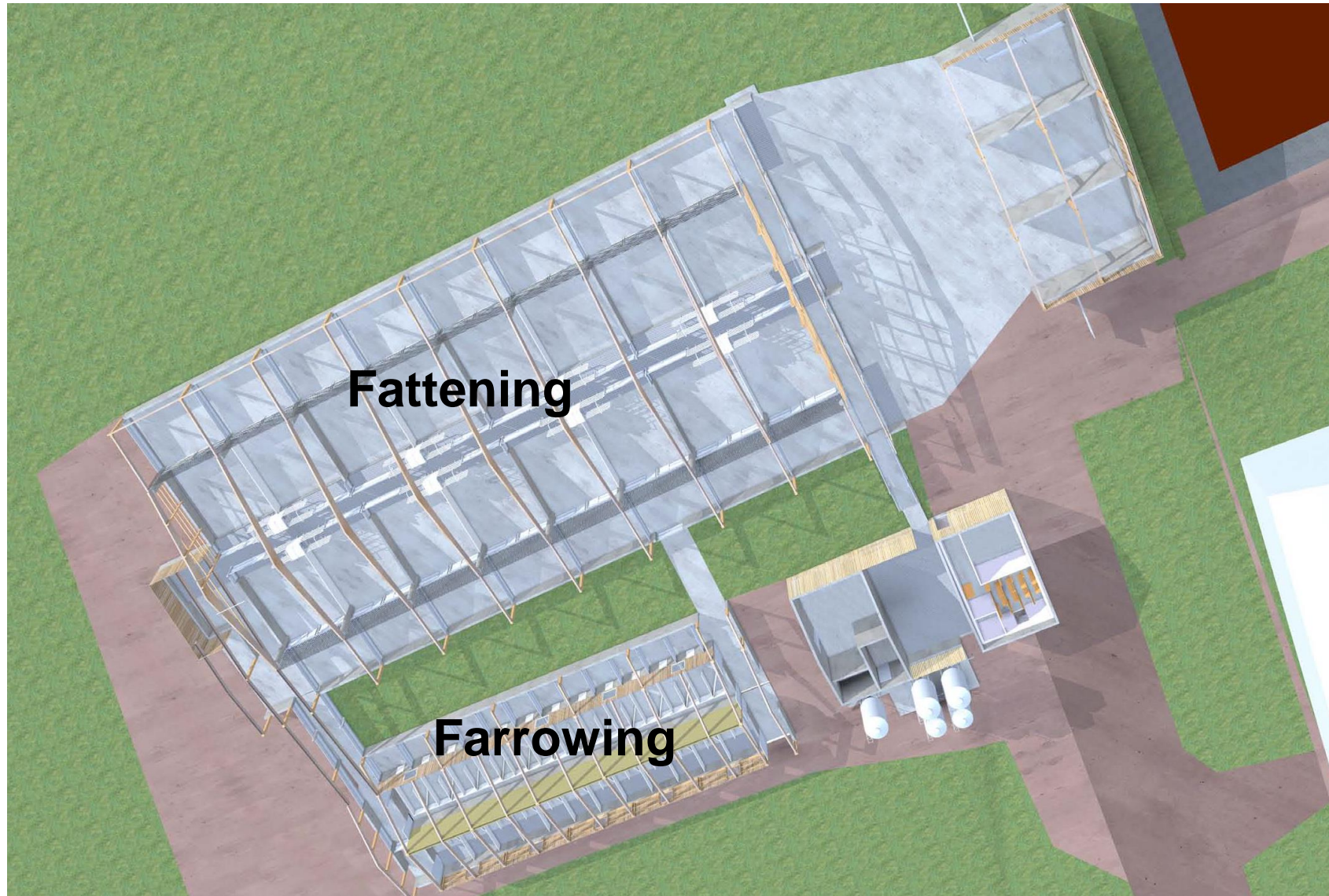
➤ Porganic: the research unit

Axonometric overview of the buildings



➤ Porganic: the research unit

Inside overview of the buildings



➤ Porganic: the research unit

Building for weaned/pregnant sows

- ✓ Dynamic group (36 places)
- ✓ Some individual stalls
- ✓ An outdoor area
- ✓ Feeding with an automat station + rack containing hay distributed ad libitum



➤ Porganic: the research unit

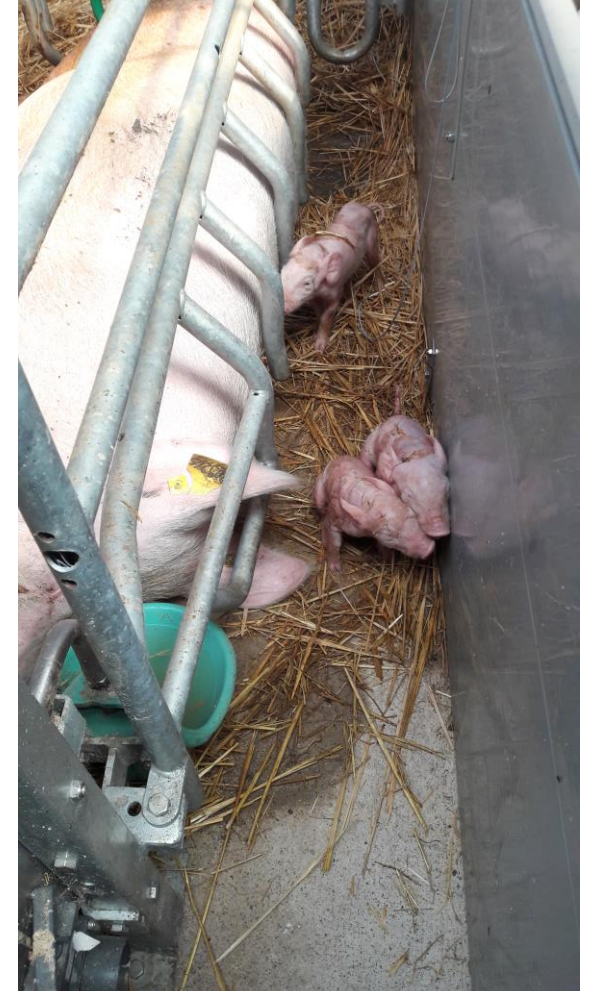
Video of sows
eating hay



➤ Porganic: the research unit

Building for farrowing/lactating sows:

- ✓ 2 x 12 places
- ✓ Sows can be blocked around farrowing or left always free
- ✓ An outdoor run for 12 farrowing stall
- ✓ A nest covered by transparent plexiglass



➤ Porganic: the research unit

Gate to the outdoor run



Piglet's nest



➤ Porganic: the research unit

Video of a sow with her piglets
massaging the teats



➤ Porganic: the research unit

Video of a sow with her piglets active in the resting area



➤ Porganic: the research unit

The weaning/fattening building

- ✓ 16 stalls with 30 places
- ✓ Deep straw inside
- ✓ An outdoor area on concrete floor, covered and opened on 3 sides



Inside views of the weaning/fattening building

➤ Porganic: the research unit

Outdoor area



➤ Porganic: the research unit

More information on youtube



<https://youtu.be/GqAMdNValgs>

➤ Porganic: three examples of research programs

- ✓ Research concerning the fulfilment of iron requirements in piglets: head by E Merlot within the EU research program POWER
- ✓ Research to optimize the rearing of entire male pigs (improve animal welfare and meat sensory quality): head by B Lebret within the EU research program PPILOW and the national program Farinelli
- ✓ Research to reduce piglet mortality by genetic selection: head by L Canario within the EU research programs POWER and PPILOW (presentation by L Canario)



Iron requirements of suckling piglets



Iron is necessary to synthesize haemoglobin (red blood cells) and myoglobin (muscles)

- ❑ High needs due to a rapid growth, 5-7 mg/day
- ❑ During lactation, iron comes from:
 - ✓ Body store acquired during foetal life, consumed in a few days
 - ✓ Milk intake (~ 1 mg/day)
 - ⇒ **Insufficient, additional supplies are necessary**
 - ⇒ **They come from:**
 - ✓ Soil ingestion in piglets reared outdoors
 - ✓ Dry feed consumption, but low until 3-4 weeks of age
 - ✓ Neonatal supplementation of iron by injection or by ingestion of an oral paste



Specificity of organic farming



- ❑ **Systematic supplementation with iron is problematic in organic pig production:**
 - ✓ Preventive use of allopathic treatment is forbidden (CE 889/2008)
 - ✓ A fattener can be sold as organic if only one allopathic treatment (except treatments against parasites, vaccinations and compulsory treatments) is applied,
 - ✓ Iron injection can be considered as an allopathic treatment by some certification bodies
 - ✓ In addition to legislation, iron injection is a non-natural massive treatment that may induce oxidative stress
- => Many organic farmers do not perform iron treatment inducing a very high risk of anaemia in indoor farms**



Objective of the study



Find a solution to supplement with iron piglets raised indoors that:

⇒ **follows organic rules**

⇒ **allows a physiological and continuous intake of iron**

➤ Experimental design



3 experimental groups

⇒ Piglets from 8 litters injected with 100 mg dextran-iron injection, n = 98

⇒ Piglets from 8 litters receiving soil from 4 days of age, n = 102

⇒ Piglets from 8 litters receiving peat, n = 102

2 batches: 4 litters/treatment/batch

Briere river mud

Sterilized & dry peat

(26,1 g iron/kg dry peat)



Peat



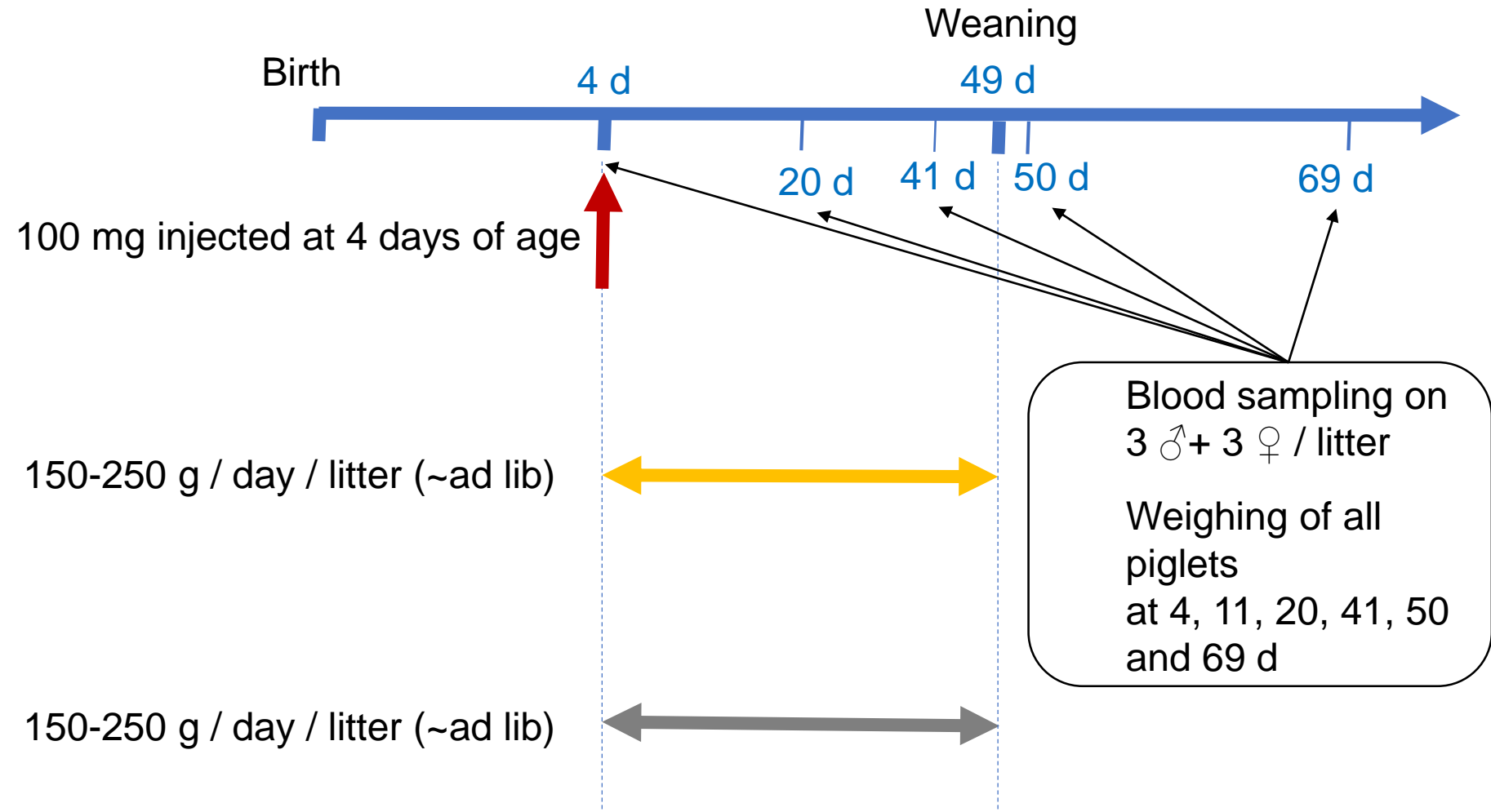
Soil of the farm

Sterilized and dry
(49,7 g iron/kg dry soil)

➤ Experimental design



-  **Injectable dextran iron**
-  **Farm soil**
-  **River peat**



➤ Results: growth



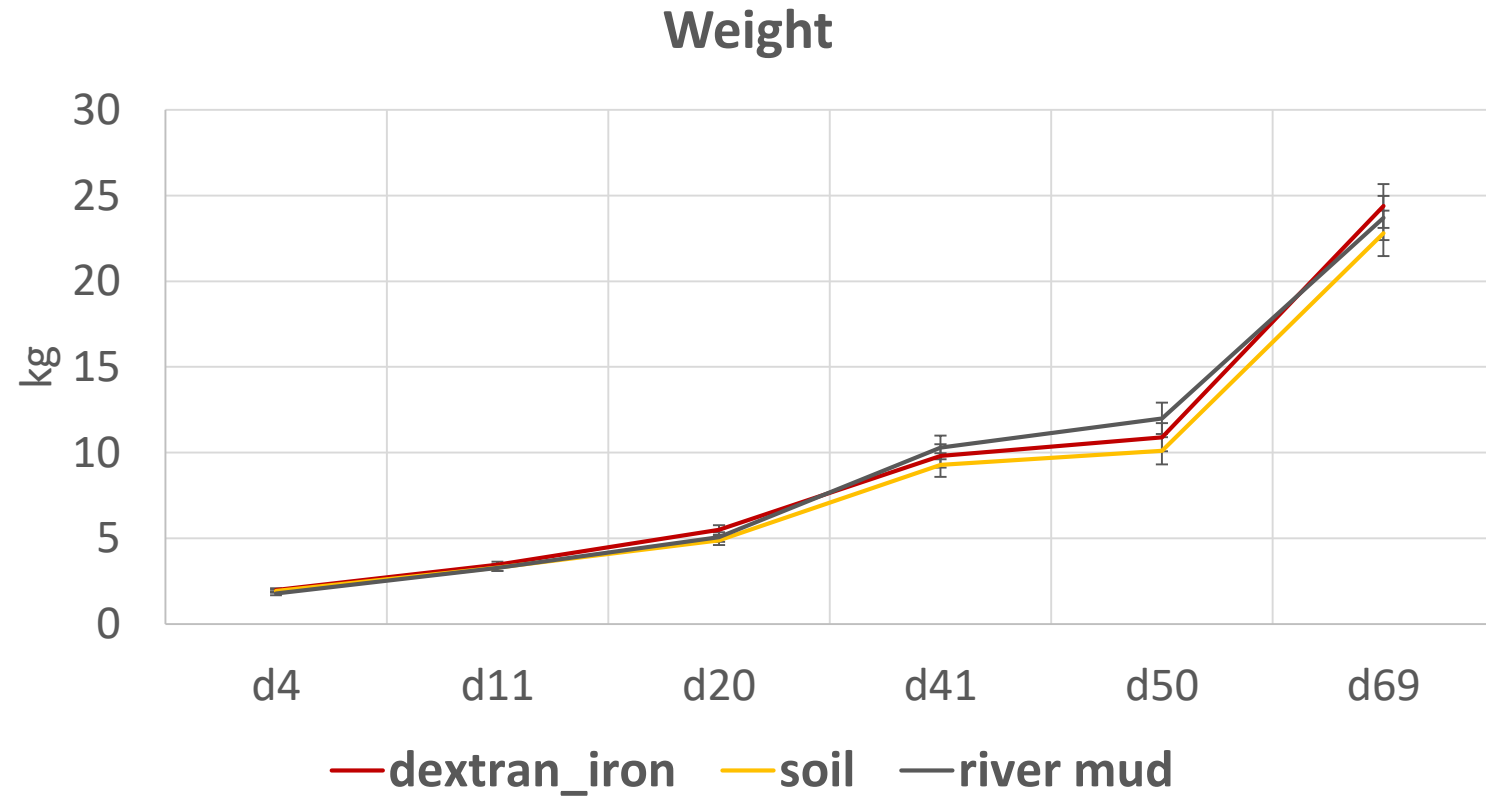
**Injectable
dextran
iron**



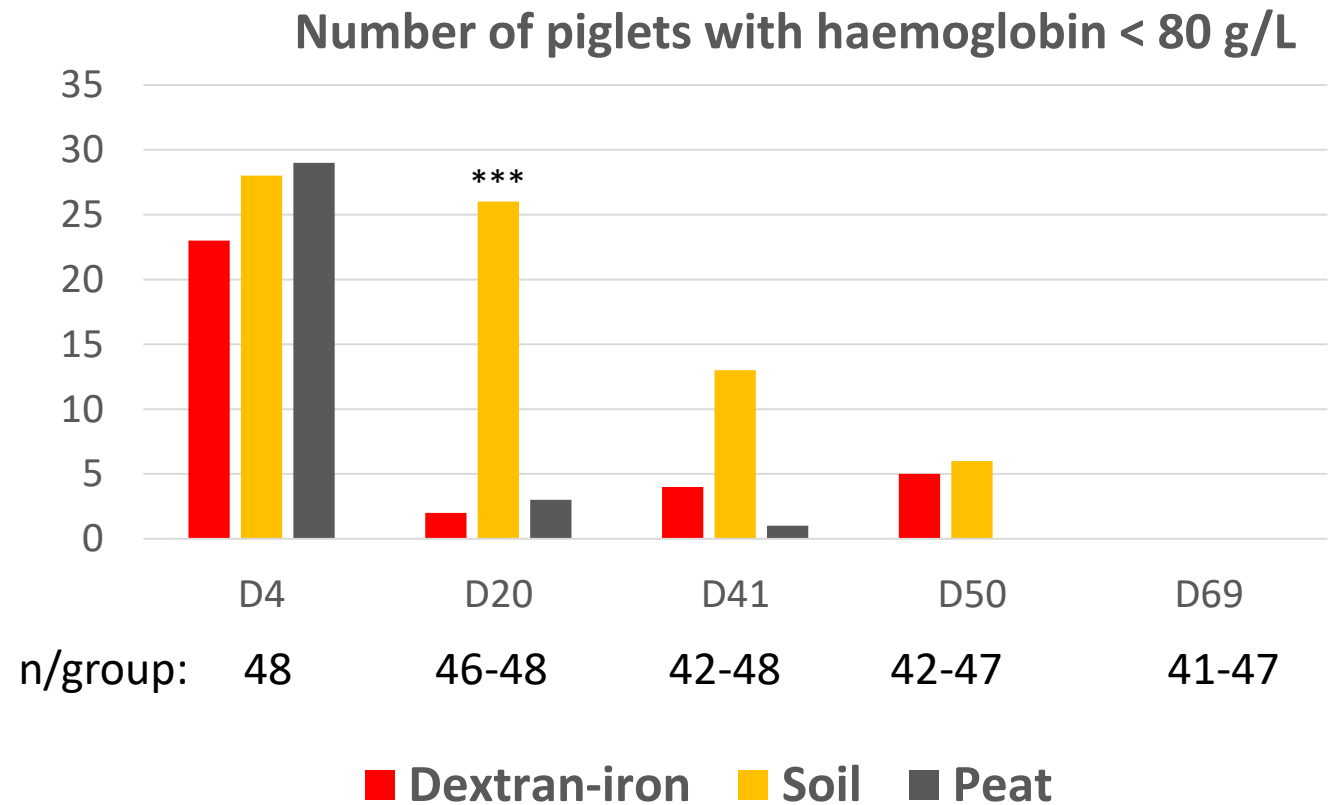
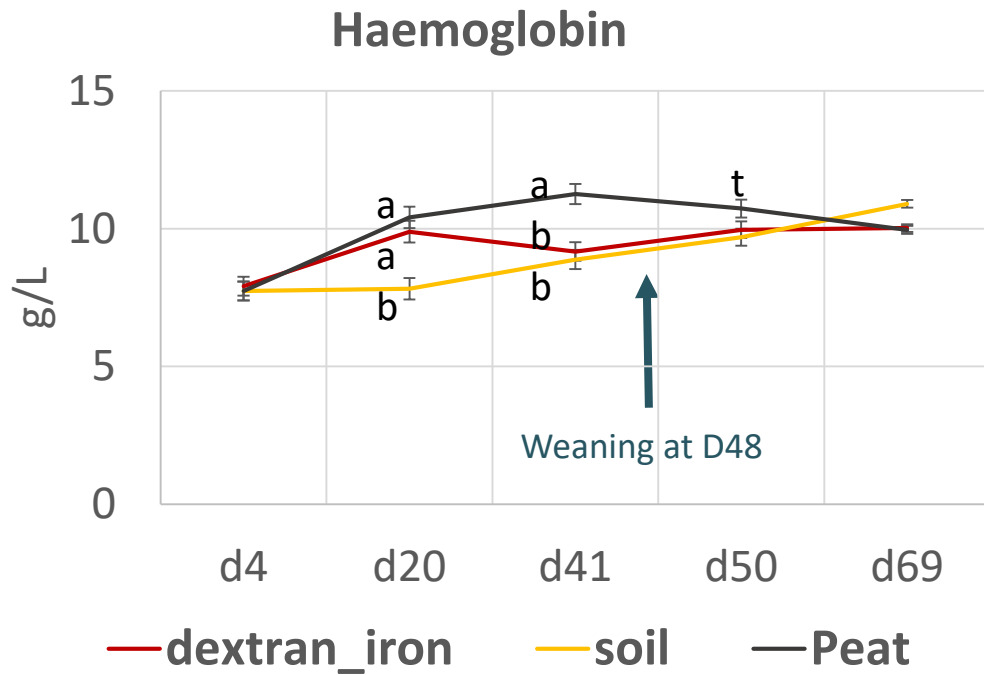
Farm soil



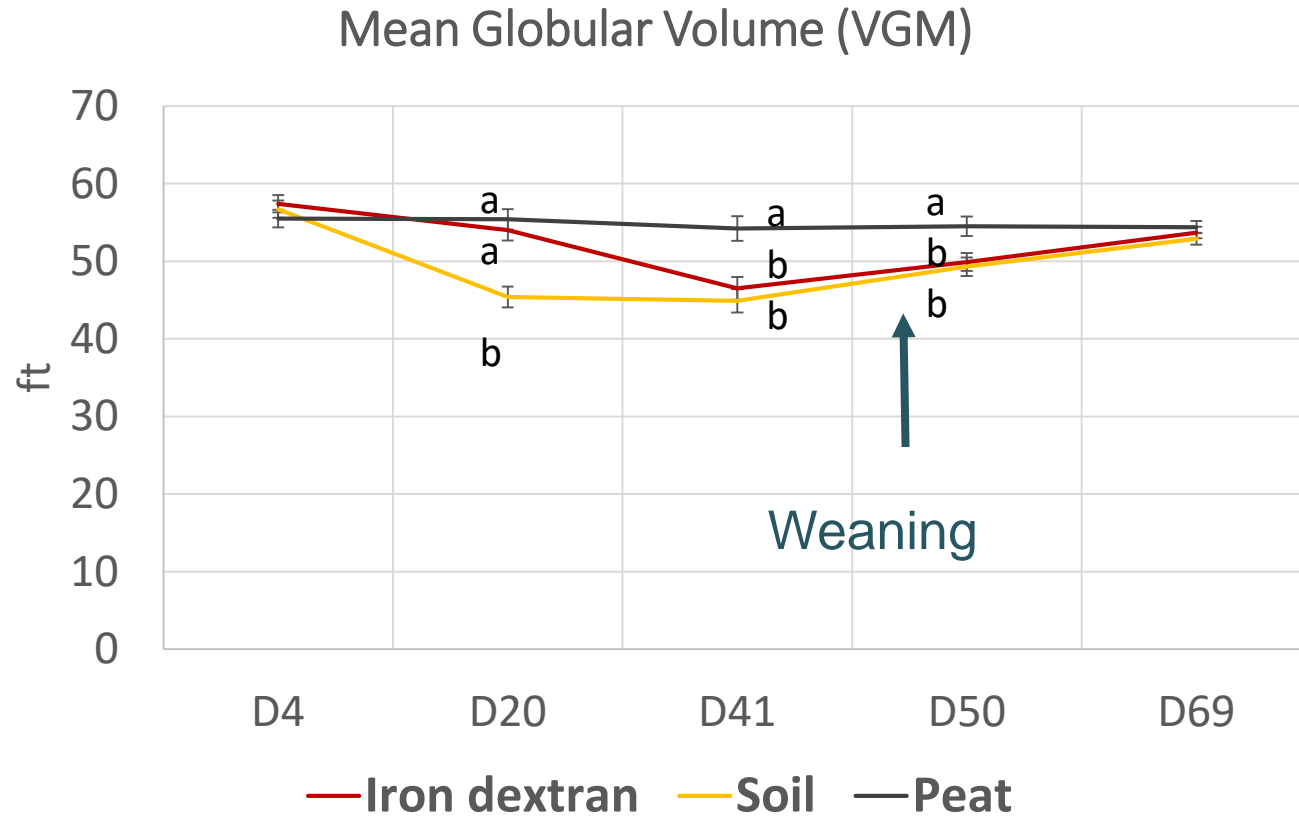
River peat



➤ Results : haemoglobin status



➤ Results : mean globular volume of erythrocytes



⇒ **Iron intake**

Insufficient in the soil group by D20
and in the dextran iron group by D41

+ other measures suggesting oxidative stress in the dextran group, more diarrhoea and a delay in maturation of the immune system in the soil group



➤ Conclusions



- Injection with 100 mg iron
 - Sufficient until D20 but not until weaning in organic pigs
 - Suspicion of oxidative stress
- Supplementation with soil
 - Not a reliable solution as shown by anaemia in the present experiment
 - In addition, increased risk of diarrhoea and possible delay in immune maturation
- Supplementation with peat from the Briere river
 - A promising option
 - To be confirmed by other studies on a higher number of pigs
 - Iron from the peat has probably a high bioavailability



➤ Porganic: research on organic male pigs

Objectives

- Develop strategies to **prevent undesired behaviours** (mounting, aggressions) in intact male pigs and to **avoid boar taint** (androstenone, skatole) in the end-products
- Allow **ending of surgical castration in good conditions** for animals, producers and consumers
- **2** experimental trials: one within PPILOW, one within Farinelli, same protocol of measures but different experimental treatments



➤ Porganic: research on organic male pigs



Experimental aims of the first trial

- ✓ Compare welfare and boar taint according to genotype (Piétrain vs Duroc crossbreeds) -> synergies and trade-offs between various quality dimensions.
- ✓ Predict boar taint at lower live weights (85, 105 vs 125 kg)

Experimental design

- ✓ Two replicates of 60 intact male pigs. In each replicate 30 pigs (= one group) of each genotype
- ✓ Pigs born from LW dams and either Piétrain or Duroc sires with semen provided by Nucleus and selected for low taint risk

➤ Porganic: research on organic male pigs



Experimental design of the first trial:

- ❑ First replicate: piglets born, start in October -> slaughtering in Feb-March 2022
- ❑ Second replicate: start in December -> slaughtering in April 2022
- ❑ Pig rearing: measure of indicators of behavior, welfare and health. Growth performance
- ❑ Blood sampling for predicting fat androstenone and skatole by measuring oestradiol and skatole in plasma + *in vivo* assessment of body composition at 85, 105 and 125 kg weight

➤ Porganic: research on organic male pigs



Experimental design of the first trial:

- ❑ At slaughter ~125 kg:
 - ✓ carcass traits: weight, lean meat content
 - ✓ technological, nutritional and sensory quality traits: boar taint compounds content (androstenone, skatole and indole in backfat), loin and ham pH, colour, water-holding capacity, loin chemical composition and shear force

➤ Porganic: research on organic male pigs

Experimental aims of the second trial

- ✓ Compare welfare and boar taint according to feeding (diet enriched in local and fiber components vs “standard” organic diet)
- ✓ Predict boar taint at lower live weights (85, 105, 125 kg)

Experimental design

- ✓ Two replicates of 60 intact male pigs. In each replicate 30 pigs (= one group) of each experimental group
- ✓ Pigs born from LW dams and Piétrain sires with semen provided by Nucleus and selected for low taint risk
- ✓ Similar measures to those performed in the first trial



➤ Conclusion

Porganic a great tool for working on
organic pig production

Thanks for your attention!

